Bat Activity Survey

Donacarney R150 Footpath & Cattlepass

August 2021

Final Report – Not Confidential

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Document Control

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Draft V01	14/07/2020	Draft to client	Not confidential	EC	SH	CS
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Field Investigations and Data

Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work. Where any data supplied by the client or from other sources have been used it has been assumed that the information is correct. No responsibility can be accepted by EcoNorth Ltd. for inaccuracies in the data supplied by any other party.

Declaration of Compliance

"The information which we have prepared and provided is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct. We confirm that the opinions expressed within this document are our true and professional bona fide opinions."

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Contents

Summary

EcoÉireann was commissioned by ORS on behalf of Meath County Council to undertake a bat survey to inform the proposed development of a shared pedestrian and cycleway along the R150, between Realt na Mara Bunscoil and Bettystown Cross in Donacarney, Co. Meath. The survey comprised a preliminary bat roost assessment of the trees along the section of hedgerow proposed to be removed, followed by a transect activity survey on the night of the 15th/16th June 2020. This assessment was designed to highlight key ecological constraints, assess the potential impacts upon bats and support the planning application.

A desk study completed prior to the field visit found no records of any bat species within 2km of the site boundary; records within the relevant 10km grid square included Daubenton's, Leisler's, common pipistrelles and soprano pipistrelles. No statutory sites designated due to the presence of bats are known to be present within 20km of the development area.

The following table highlights the key findings of the surveys, based on the information available to date. Requirements for further surveys are highlighted, while necessary mitigation measures are provided in Section 7; further measures will be agreed as necessary following on from the completion of the additional surveys outlined below.

Feature / Species	Site Conditions	Key Survey Results	Ecological Value	Further Surveys Required Pre-Planning?	Key Mitigation Required?
Habitats (Bats)	Site dominated by hard standing tarmac lined with hedgerows, further described below. A number of semi-mature trees are interspersed along the eastern portion of hedgerow.	Foraging activity concentrated along western side of road around wooded areas.	Low - local	No	N/A
Trees (Bats)	A number of mature/ semi-mature ash trees are located along the eastern side of the southern section of the proposed works area	3 mature/ semi-mature ash trees with minor potential roost features are located within the area of hedgerow proposed for removal. Low bat roost potential.	Due to the surrounding availability of mature trees with extensive bat roost features evident and the adjacent farm outbuildings it is considered that these trees are	No, felling works may proceed to a suitably designed precautionary method statement i.e. 'Soft-Felling'	Works to proceed to an appropriately precautionary method statement

Feature / Species	Site Conditions	Key Survey Results	Ecological Value	Further Surveys Required Pre-Planning?	Key Mitigation Required?
			of negligible/ low roost suitability		
Other Species	Habitats as described above have the potential to be used by a small range of other locally common species, such as nesting birds, hedgehog and pine marten	Individual pine marten recorded at two points during the bat activity survey, although no evidence of den sites recorded on site to date. Vegetation is likely to be used by a small range of locally common species of breeding bird	Low - local	No – further surveys required. Surveys for pine marten have been carried out onsite	Works to proceed to an appropriately precautionary method statement

1. Introduction

1.1 Background

EcoÉireann was commissioned by ORS, on behalf of Meath County Council (henceforth referred to as the Client) to undertake a bat survey to inform the proposed development of a shared pedestrian and cycle path along the R150 from Realt na Mara Bunscoil and Bettystown Cross in Donacarney, Co. Meath (central grid reference O14111 74133). Meath County Council proposes to develop a 3m wide shared pedestrian and cycleway along this section of the R150, along with the development of a cattle underpass in the southern section of the proposed development. The survey was designed to assess the potential use of the site by bats year-round, to highlight key ecological constraints and support the full planning application.

This report:

- Sets out the results of the survey
- Analyses the site's value for bats
- Identifies additional survey requirements in order to fully determine the baseline ecological conditions on the site
- Identifies key avoidance, mitigation and/or compensation measures required to help ensure the proposals do not have an adverse impact upon biodiversity

1.2 Site Context

Figure 1 identifies the location and extent of the development site. The proposed development is located in north-east County Meath, just south of the River Boyne estuary. The surrounding area comprises agricultural land with associated hedgerows. Within the wider landscape, residential areas are situated to the north, east, south and west, with a small patch of woodland located 0.7km to the south-east.

Figure 1: Indicative Site Boundary

1.3 Nature of the Proposals

The proposed development is for a c. 700m pedestrian link of a 3m wide shared footpath and cycle path, from the existing pedestrian facilities at Realt na Mara Bunscoil, Donacarney, south along the eastern side of the R150 to the existing pedestrian facilities at the roundabout at Bettystown Cross, see Figures 2 & 3, below. The development includes a proposed cattle underpass in the southern section of the route, details of which are provided in Figure 4, below. For detailed drawings of the development proposals please see supporting planning documentation

The northern section of the proposed pedestrian facilities will traverse the edge of an agricultural field (c. 120m) to retain the existing roadside hedgerow. From here, the shared pedestrian path will traverse the edge of the road, skirting the boundary of 9 residential properties, heading south for c. 170m.

The proposed development involves the realignment of the southern section of the R150, with a slight land take (2-3m) from the eastern side of this section (agricultural land use) of the road; the affected area is c. 800m^2 (0.197 acres). As part of the proposed works it is intended to relocate a drainage ditch in order to realign it with the new proposed path and road layout.

Within the southern section, it is proposed to remove a c.140m long section of the eastern hedgerow, bounding the road and the agricultural field between the 9no. existing residential properties and the proposed cattle underpass.

A new hedge is proposed to be installed in place of this removed hedgerow along with mammal / stock-proof fencing along the edge of the new pathway. The new cattle underpass will also act as a mammal underpass.

A new lighting scheme is being proposed for this stretch of the R150, to enable safe pedestrian and vehicular transit across the proposed development.

This report is designed to highlight key ecological constraints, assess the potential impacts upon bats and support the planning application.

Figure 2: Development Proposal North Section

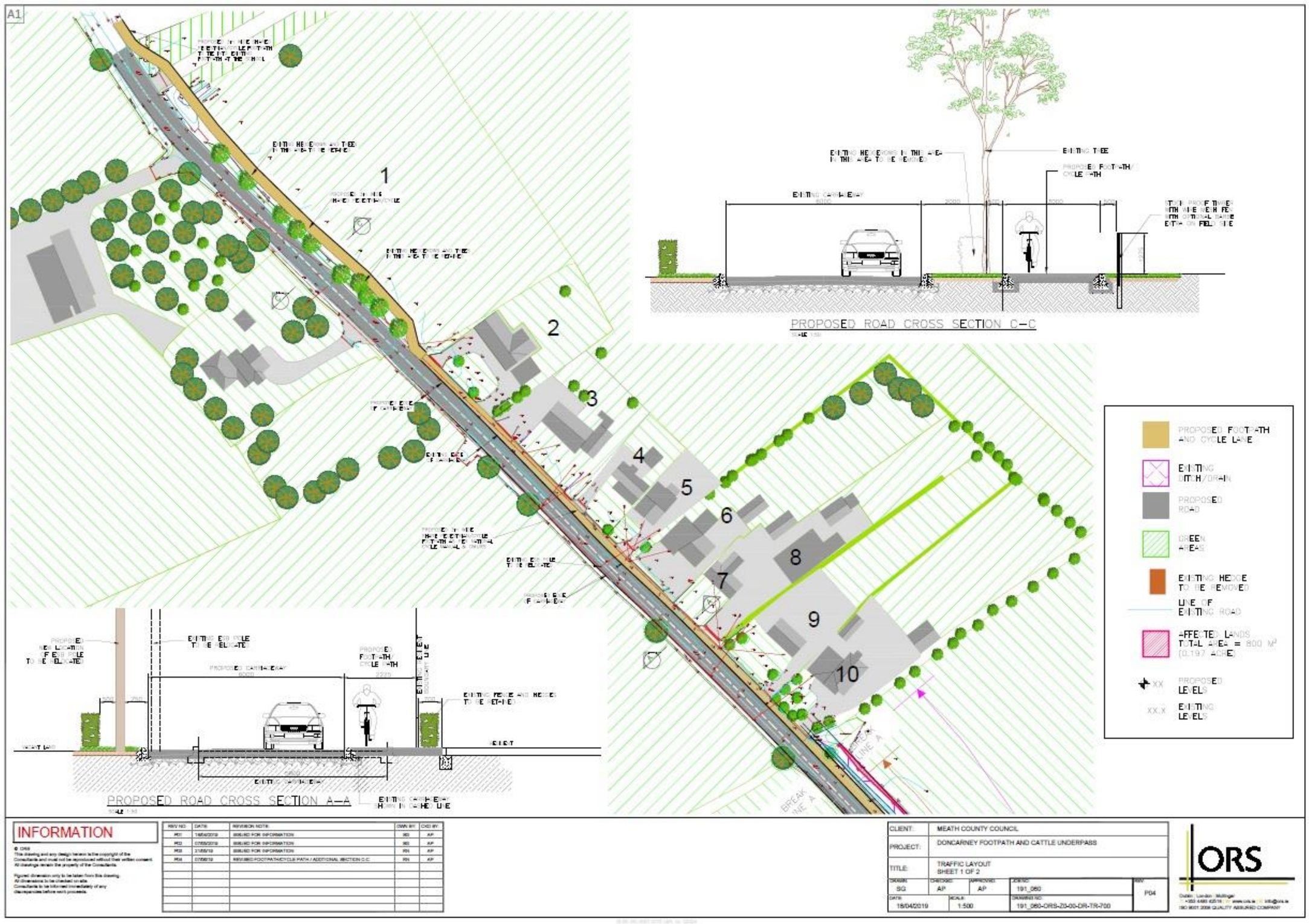


Figure 3: Development Proposal Southern Section

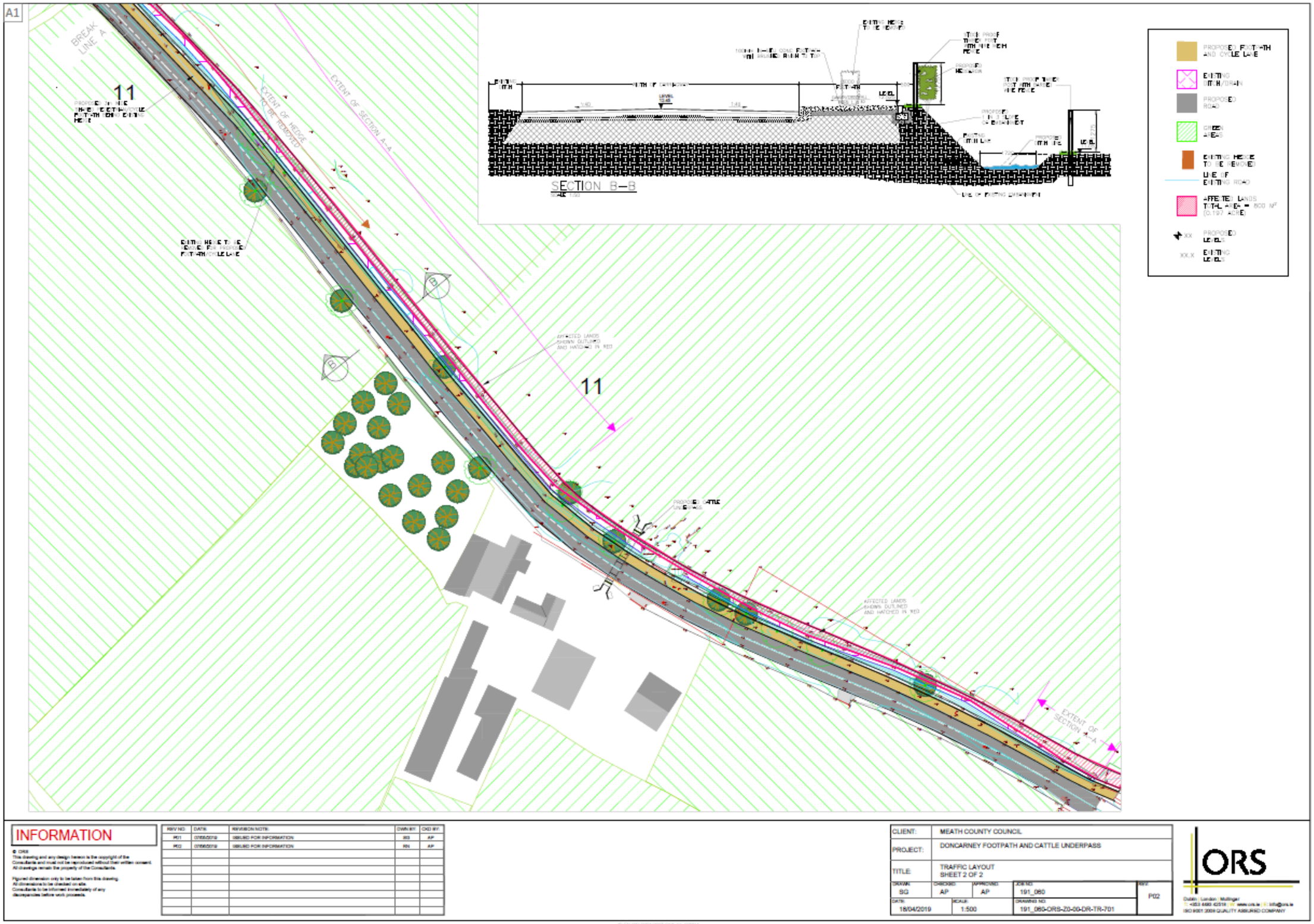
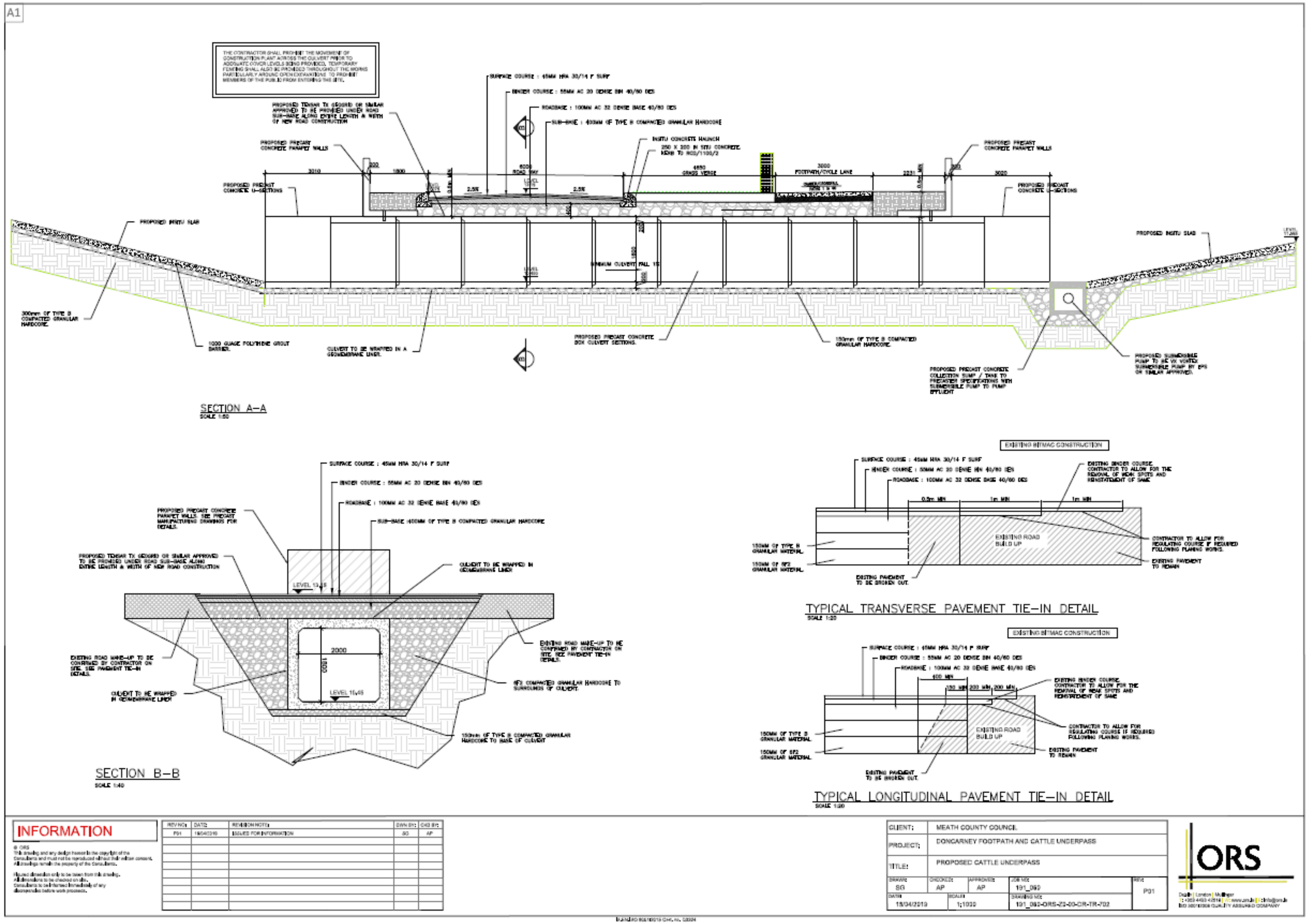


Figure 4: Development Proposal Cattle Underpass



2. Planning Policy and Legislation

2.1 Planning Policy and Guidance

A series of national and local planning policies are in place which are designed to ensure that development works do not have an adverse impact upon biodiversity, at a site or wider level. Such policies ensure that both developers and public bodies must give due consideration to the potential effects of development works upon both ecological receptors (in line with existing wildlife legislation) and biodiversity.

2.1.1 National Planning Framework

The National Planning Framework was adopted in Ireland in 2018, which is the overarching policy and planning framework for the social, economic and cultural development of Ireland. It outlines the Government's policies through the planning process, acting as guidance for local planning authorities and decision-makers. The document places a duty on local authorities to consider the principles included when assessing planning applications and preparing Local Plans and Regional Spatial Strategies. Chapter 11 relates to the conservation and enhancement of the natural environment, in line with existing wildlife legislation ensuring that environmental considerations are integrated into the Planning System.

2.2 Legislation

The most important legislation underpinning biodiversity and conservation in Ireland includes the Wildlife Act, 1976 and Wildlife (Amendment) Act, 2000 and the Flora (Protection) Order, 1999 (SI 94/1999). At a European level the EU Habitats Directive (92/43/EEC) and the EU Birds Directive (79/409/EEC) are transposed into Irish law by the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011).

All Irish bat species are protected under the Wildlife Act (1976) and Wildlife Amendment Act (2000) which makes it an offence to wilfully interfere with, or destroy, the resting or breeding place for bats. All species of Irish bats are listed under Schedule 5 of the Wildlife Act (1976) making it an offence to:

- Intentionally kill, injure or take a bat
- Possess or control any live or dead specimen or anything derived from a bat
- Wilfully interfere with any structure or place used for breeding or resting by a bat
- Wilfully interfere with a bat while it is occupying a structure or place which it uses for that purpose

The European Commission Directive on The Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive 1992) seeks to protect rare species, which includes bats

and their habitats, and requires that appropriate monitoring of populations be undertaken. All Irish bats are listed in Annex IV of the Habitats Directive 1992 and the lesser horseshoe bat is further listed under Annex II. Inclusion on Annex IV ('European protected species') means that member states are required to put in place a system of strict protection as outlined in Article 12.

The Habitats Directive is transposed into Irish law by the European Communities (Natural Habitats) Regulations 1997. These Regulations substantially strengthen the protection provided by the Wildlife Acts, and in particular they remove all of the exemptions provided in Section 23(7) of the Wildlife Act insofar as they relate to Annex IV species, including all species of bats. All bats species are listed on the First Schedule and Section 23 of the Regulations.

Under existing legislation, the destruction, alteration or evacuation of a known bat roost is a "notifiable action" and a derogation licence must be obtained from the National Parks and Wildlife Service (NPWS) before works can commence which may affect a known bat roost.

3. Methodology

3.1 Desk Study

Contextual information was gathered as part of a desk study undertaken prior to the start of field surveys. Such information can identify protected or notable species which may occur on the proposed development site or in the local area, as well as identifying statutory and non-statutory ecological sites which may have the potential to be affected by the proposals.

Bat records from within 5km of the development site were obtained from the National Biodiversity Data Center (NBDC) and reviewed as part of the desk study process.

It should be noted that an absence of records is likely to reflect an absence of survey data and cannot be taken as confirmation that a particular species is not present in the site or surrounding area.

An arboricultural assessment has been carried out on the proposed site (McConville, 2018) to ascertain the condition of the trees along the eastern side of the R150 at Donacarney, Co. Meath. This assessment recorded the majority of the trees along this stretch of road as Fair or Poor condition, defined below:

- Fair – Slightly reduced leaf cover, minor dead wood or isolated major dead wood, or;
- Poor – Overall sparse leafing or extensive dead wood

The majority of trees recorded as Poor condition are located in the southern portion of the proposed site adjacent to the roundabout at Bettystown Cross, except for a single Elm *Ulmus minor* which is located to the north of the existing residential properties.

3.2 Field Survey

3.2.1 Habitat Assessment

An assessment of the potential suitability of the habitats within the site and surrounding area for bats was undertaken as part of the initial desktop study and a walkover of the proposed development area prior to the survey commencing. This included an assessment using the criteria set out in the Bat Conservation Trust Survey Guidelines, as shown in Table 1, below.

The below criteria were used to provide a guide as to the potential suitability of the site for bats. It is important to note that an absence of potential commuting routes or 'good quality' foraging areas around a site can not be used to confirm the absence of bats from a site. Bats are highly mobile animals which will use different habitats at different times of the year, therefore an appropriate level of additional survey work must be carried out in order to determine if and how bats utilise a particular site.

Table 1: BCT Guidelines for Assessing the Value of Habitats for Bats.

Feature	Value
Evidence indicating that a structure/feature is used by bats, such as: • Bats seen roosting or emerging/entering a structure/ feature; • Field signs such as droppings, feeding remains or carcasses found; and/or • Bats heard calling or 'chattering' within a roost. Bats recorded/observed using an area for foraging or commuting	Confirmed Roost
• Site is close to known roosts • Site is connected with the wider landscape by strong linear features that would be used by commuting bats e.g. river/stream valleys or hedgerows • Habitat of high quality for foraging bats e.g. broadleaved woodland, tree-lined watercourses, parkland • Buildings, trees or other structures e.g. mines, caves, tunnels, ice houses and cellars, with features of particular significance for roosting bats	High Value Habitat ↓

Feature	Value
• Site is connected with the wider landscape by linear features that could be used by commuting bats e.g. lines of trees and scrub or linked back gardens • Habitat could be used by foraging bats e.g. trees, scrub, grassland or water • Several potential roosts in the buildings, trees or other structures	↓
• Isolated site not connected by prominent linear features (but if suitable foraging habitat is adjacent it may be valuable if it is all that is available • Isolated habitat that could be used by foraging bats e.g. a lone tree or patch of scrub, but not parkland • Small number of potential roosts generally of lower conservation importance e.g. probably not maternity roosts or hibernacula	↓
• No features that could be used by roosting bats for foraging, roosting or commuting.	Low Value Habitat

3.2.2 Tree Surveys

Preliminary Bat Roost Assessment / Field Sign Survey

An assessment was made of the suitability of the trees within the site to support roosting bats on 15th/16th June 2020. Each tree was inspected and notes made of the species, approximate height, diameter at breast height (DBH) and any features which provide potential bat roost sites e.g. holes, splits in the trunk or limbs, flaking bark, areas covered by ivy. Each tree was inspected from the ground using binoculars and a high-powered torch.

Where any field signs indicating the presence of bats, or bats themselves were recorded, a note was made of the location of the roost. Where roosts were not confirmed, each tree was classed as negligible, low, moderate or high suitability, based on the potential for such features to be present.

Table 2: Classification of Trees for Risk of Bat Roost Presence (BSI, 2015)

Tree Category	Description	Further Survey Requirements
Known or confirmed roost	Know or confirmed roost	If work to trees cannot be avoided, a specialist bat roost assessment should be undertaken to establish bat species, numbers and the nature of the roost.

Tree Category	Description	Further Survey Requirements
High risk	Tree of sufficient size and age to contain bat roosts with several potential roost features	Specialist bat roost assessment should be undertaken if work to a tree cannot be avoided. Minimum of 3 activity surveys required, Assessment to include techniques such as endoscope use or aerial assessment by tree climber. Following this assessment, the tree could be up-graded or down-graded.
Medium risk	Tree of sufficient size and age to contain bat roosts with potential roost features	Two activity surveys required OR aerial assessment by tree climber (as above)
Low risk	Trees of sufficient size and age to contain bat roosts but with no obvious potential roost features seen during the scoping survey, or features seen with limited roosting potential only, e.g., small amounts of ivy.	Felling should be carried out to a method statement with a Suitably Qualified Ecologist to be contacted if bats are found during works.
Negligible / No risk	Trees with no potential to support bats	None

Potential roost features (PRFs) include:

- Knot holes arising from naturally shed branches, or branches previously pruned back to the branch collar
- Man-made holes or cavities created from branches tearing out from parent stems
- Cracks/ splits in stems or branches
- Partially detached platey bark
- Cankers (caused by localized bark death) in which cavities have developed
- Other hollows or cavities, including butt-rots
- Compression forks with included bark forming potential cavities
- Crossing stems or branches with suitable space between for roosting
- Ivy stems with a diameter of >50mm, with suitable roosting space behind, or where a roosting space is evident where a mat of thinner stems has left a gap between the mat and the trunk
- Bird or bat boxes in trees
- Other features that offer a place of shelter

3.2.3 Site Activity Surveys

Transects

A transect survey was undertaken to assess the levels of bat activity along the proposed development area, identify potentially important foraging or commuting routes and provide an indication of which species, if any, are present within the site. The transect route covered the linear features of the proposed development e.g. hedgerows, woodland edges, which provide potential foraging areas and commuting routes. Although most bats tend to stay close to linear features when commuting, some of the larger species, such as noctules, will readily cross and forage within areas of open land.

Survey methodology was carried out in line with Bat Conservation Trust (BCT) Guidelines (Collins, 2016) and following advice from Bat Mitigation Guidelines for Ireland (Kelleher and Marnell 2006). Two surveyors walked a pre-defined transect route along the R150 verge, from Bunscoil Realt na Mara to the roundabout at Bettystown Cross, taking in all areas of the proposed development. Each transect included 2 circuits of the proposed development. A series of stopping points were predefined along the transect route to take in potential areas for bat activity, where surveyors stopped for 5 minutes recording all bat activity (visual and aural).

The transect route was walked by two surveyors who used a Batbox Duet detector linked to a Zoom H2D recorder, and a Wildlife Acoustics Echo Meter Touch 2 Pro linked to an iPad, to assess and record bat activity. The start point of the transect was varied between the dusk and dawn surveys, to allow for potential variations in the use of different sections of the site by bats at different times. The transect route is shown in Figure 5, below. Conditions during each survey are shown in Table 3.

Table 3: Survey Times and Weather Conditions

Date	Sunset/ rise (BST)	Start Time (BST)	End Time (BST)	Precipitation	Temperature (°C)	Cloud Cover (Oktas)	Wind (Beaufort Scale)
15/06/2020	21:58	21:40	00:15	None	13	2/3	1
16/06/2020	04:54	03:00	05:10	None	10	3/4	1

Figure 5: Transect Route and Stopping Points

3.2.4 Analysis of Results

Recordings made using the Echo Meter Touch 2 Pro recorders were analysed using Kaleidoscope. The program can help to confirm the identification of the different calls recorded to species level using sonograms and power spectra, along with the measurements of a range of variables such as inter-pulse interval, minimum and maximum frequencies and pulse length. Foraging activity or social calling can also be identified in this way.

It should be noted that it is not always possible to confirm calls to species level. *Pipistrellus* sp. and *Myotis* sp. can usually be separated with a high degree of confidence and it is normally possible to identify pipistrelle bats to species level however, many of the *Myotis* sp. have similar calls and it is not always possible to confirm identification to species level. This is also the case with species which echolocate very quietly, such as brown long-eared bats, as it may not be possible to record a strong enough call to confirm the assessment. Any uncertainties in identification are noted in this report.

With regards to number of bat passes recorded, this refers to the number calls captured by the detector (manual or remote) and it does not indicate the number of bats present; multiple calls of a single bat may be recorded should a bat stay in close proximity to the surveyor/remote detector for a period of time.

3.2.5 Personnel

Surveys were completed as shown in Table 4.

Table 4: Survey Personnel

Survey	Date	Survey Leader	Assistant Surveyors
Tree Preliminary Bat Roost Assessment	15th/16th June 2020	Eoin Cussen	N/A
Transects	15th/16th June 2020	Eoin Cussen	Rozanne Bell

Any constraints or limitations to the survey are discussed in Section 6.1.

4. Baseline Conditions

4.1 Desk Study

No statutory or non-statutory sites designated due to the presence of bats were identified within 20km of the survey site. The NBDC provided a number of records of bats within the surrounding 10km Grid Square (O17) of the site, including records of Daubenton's *Myotis daubentonii*, Leisler's *Nyctalus leislerii*, common pipistrelles *Pipistrellus pipistrellus* and soprano pipistrelles *Pipistrellus pygmaeus*. Further details of these records are provided in Table 5.

Table 5: Species Records from the NBDC

Common name	Species Name	Distance from site (km)	Direction from site	Record count	Date of last record
Brown long-eared	*Plecotus auritus*	2.65	NW	1	25/06/1998
Daubenton's	*Myotis daubentonii*	2.3	NW	15	06/08/2012
Lesser noctule / Leisler's	*Nyctalus leislerii*	5.1	WNW	2	11/05/2011
Common pipistrelle	*Pipistrellus pipistrellus*	3.3	N	2	11/05/2011
Soprano pipistrelle	*Pipistrellus pygmaeus*	2.6	NW	5	11/05/2011

4.2 Field Survey

4.2.1 Habitat Assessment

Habitats within the proposed site were found to be dominated by hard standing (tarmac) lined with hedgerows of varying maturity and complexity, with a number of adjacent residential properties and surrounded overall by agricultural fields, both pasture and arable. Such habitats are considered to provide low to moderate quality habitat for bats, with the majority of the hedgerow being comprised of bramble and low intensively managed trees (sycamore *Acer pseudoplatanus*, ash *Fraxinus* excelsior) and scrub (elder *Sambucus nigra* and hawthorn *Crataegus monogyna*. A number of semi-mature ash trees and sycamore trees are interspersed along the eastern portion of hedgerow which provide potential feeding and roosting locations for bats. There are 2 small wooded areas adjacent to the proposed development, both on the west side of the road; one in the northern section and one in the southern section to the north of the proposed cattle underpass.

The proposed site is relatively well connected to the surrounding area, with extensive hedgerow networks bounding the surrounding agricultural fields, the majority of which lie to the north, west and south of the proposed development, providing good commuting habitat for bats in the local area.

4.2.2 Tree Surveys

Preliminary Bat Roost Assessment / Field Sign Survey

3no. semi-mature ash trees are present within the section of hedgerow proposed to be removed, these were recorded as having negligible/ low risk with small minor potential roost features present, including small knot holes and mats of ivy up to 2.5m up the main stem. Photographs are provided in Appendix A. Due to the surrounding availability of mature trees with extensive bat roost features evident (directly across the road is a veteran ash tree with extensive potential roost features present) as well as the adjacent old stone farm outbuildings and wooded areas it is considered that these 3no. trees are on the negligible side of roost suitability in the surrounding area.

These three trees have been recorded as Fair condition within the Arboricultural Assessment (McConville, 2018). The three trees in question were assessed as part of the Arboricultural assessment, this assessment is included below in Table 6.

Table 6: Trees proposed for removal and classified under the Arboricultural Assessment

Tree No.	Species	Height (m)	Condition	Age	Remarks
1053	Ash *Fraxinus excelsior*	14.8	Fair	Early-mature	A tree with a single stem, it has a one sided crown with dense ivy cover. It has one low lateral to the west, it has basal suckers and truncated branches.
1054	Ash *Fraxinus excelsior*	17.8	Fair	Early-mature	A tree with single stem, it has dense ivy cover and a one sided crown. Kit has scattered deadwood and tip die back, it has a stub at its base and basal suckers.
1055	Ash *Fraxinus excelsior*	20.2	Fair	Mature	This trees main stem bifurcates, it has multiple scaffolds in its upper crown. It has dense ivy cover, tip die back, scattered deadwood and truncated branches.

No field signs indicating the presence of bats were recorded during the survey.

4.2.3 Site Activity Surveys

Transects

The dusk and dawn transects were completed on 15th and 16th June 2020. Activity recorded across the surveys was low, with commuting and feeding activity concentrated around the more wooded areas, adjacent to the northern section of the site and to the north of the proposed cattle underpass.

Three species were recorded throughout the survey period including Leisler's, common and soprano pipistrelles, with the majority of bat activity being recorded during the dusk survey. Soprano pipistrelles comprised the majority of recorded bat calls.

Leisler's activity was concentrated around the farmyard and wooded area in the southern section of the proposed development adjacent to the proposed cattle underpass. With one Leisler's bat visibly feeding in the area for over 15 minutes, towards the end of the dawn survey.

Other Species

Pine marten *Martes martes* was recorded on two occasions during the dawn survey on 16th June 2020, once at 03:19 along the hedgerow on the west side of the road at the watercourse crossing (at stopping point 12), and once at 04:21 along the east side of the road just north of the proposed cattle underpass, along the southern portion of the hedgerow proposed to be removed.

The hedgerows and trees within the survey area are also likely to be used by a small range of locally common species including hedgehog and birds during the nesting period.

5. Interpretation and Discussion

5.1 Survey Constraints and Further Survey Requirements

During the dawn survey a fog bank rolled in at 04:25, reducing visibility to c.100m during that period. Cutting the survey short was considered at the time, however, bat activity (measured from echolocation calls) similar to previous levels was recorded during this time indicating that activity levels were not being adversely affected by the weather conditions and so this was not considered a major constraint.

The bat activity surveys were carried out in optimal weather conditions during the main bat activity period (which runs from May through to August every year) using two surveyors for health and safety reasons along the roadside verge; considering the extent of the proposed works the bat survey was not considered to be majorly constrained.

The analysis software could not identify some species, which is typically based on the quality of the call. Where feasible, the "unidentified" call was analysed manually to ascertain if the call could be identified. Manual analysis identified these unidentified calls as *Pipistrellus* species, however these could not be identified to species level due to the quality of the recordings, and therefore were recorded as unidentified pipistrelle calls. This is not considered a major constraint to the assessment.

Further species specific surveys have been conducted for pine marten *Martes martes* along the portion of hedgerow proposed for removal. No evidence of denning, resting or territorial marking sites was recorded during this survey.

5.2 Assessment of Value

Based on the results of the desk study and field work completed to date, the site is valued as shown in Table 6, below, using the criteria outlined in Section 4.3.

Table 6: Value of Ecological Features Recorded on Site

Feature	Value for Bats	Justification
Habitats	Low – local	Relatively open, under-developed intensively managed hedgerows which provide low-moderate quality foraging habitat but provide potential commuting routes for bats locally
Trees	Negligible/ Low Roost Risk	The majority of the trees are to be unaffected by the proposed development. However, three mature/ semi-mature ash trees are located within the portion of hedgerow proposed for removal. These trees host several minor potential roost features for bats including ivy cover up to 2.5m and small knot holes. It is considered that due to the few potential small roost features evident within these trees, the surrounding availability of mature trees with more extensive bat roosting features (i.e. mature ash tree directly across the road, which has numerous evident potential roost features) as

Feature	Value for Bats	Justification
		well as the adjacent old stone farm outbuildings and wooded area, that these 3no. mature/ semi-mature trees are considered to be of low bat roost suitability in the context of the surrounding area.

5.3 Input into the Design Process

In order to minimise the potential impacts of the proposals upon bats, the proposals will ensure that the lighting scheme for the proposed development is appropriate and will not negatively affect nocturnal mammals.

Nocturnal mammals are impacted by artificial light. Therefore, it is important that lighting installed within the proposed development site is completed with sensitivity for local wildlife while still providing the necessary lighting for human usage. Luminaire design is extremely important to achieve an appropriate lighting regime. Luminaires come in a myriad of different styles, applications and specifications which a lighting professional can help to select. The following principals are to be followed when choosing luminaires and designing the lighting regime, as specified in the most recent BCT Lighting Guidelines (BCT, 2018):

- Lighting design will be flexible and be able to fully take into account the presence of protected species. Therefore, appropriate lighting will be used within the proposed development and adjacent areas with more sensitive lighting regimes deployed in wildlife sensitive areas, such as along hedgerows, tree lines and woodland edges.
- Lighting should not spill onto important commuting and foraging areas identified for local bat populations.
- All luminaires used will lack UV/IR elements to reduce impact
- LED luminaires will be used due to the fact that they are highly directional, lower intensity, good colour rendition and dimming capability
- A warm white spectrum (<2700 Kelvins) is achieved to reduce the blue light component of the LED spectrum
- Luminaires will feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats
- The use of specialist bollard or low-level downward directional luminaires should be considered in bat sensitive areas to retain darkness above
- Column heights will be carefully considered to minimise light spill. The shortest column height allowed should be used where possible
- Only luminaires with an upward light ratio of 0% and with good optical control will be used

- Luminaires will always be mounted on the horizontal, i.e. no upward tilt
- Any external security lighting will be set on motion-sensors and short (1min) timers
- As a last resort, accessories such as baffles, hoods or louvres will be used to reduce light spill and direct it only to where it is needed.

5.4 Impact Assessment

Based on the proposals as shown in Figures 2-4, the development will have the following impacts if an appropriate mitigation strategy is not implemented:

- Loss of the 3no. trees with Low bat roosting suitability may result in the loss of very minor potential bat roost features, however numerous other potential roost areas exist in the surrounding area including adjacent old stone farm outbuildings, wooded areas and adjacent mature trees with extensive potential bat roost features
- Works have the potential to result in the harm and/or disturbance of any protected or notable species present at the time of works, such as bats, breeding birds and pine marten
- Loss of a section of hedgerow may result in a minor temporary impact on local populations of birds, bats and pine marten though loss of nesting, foraging and / or commuting habitat. This impact is considered minor and temporary due to the existing intensively managed nature of the hedgerow and as a supplementary hedgerow is proposed to be planted as part of the proposed development.

6. Mitigation and Compensation Strategy

The following measures will be implemented in order to minimise the ecological impacts of the proposals, including the risk of bats being adversely affected:

- Felling works affecting the 3no. mature/ semi-mature trees identified as Low potential roost suitability, within the area of hedgerow proposed for removal can proceed to a precautionary 'soft-felling' method statement. Whereby limbs are cut and lowered to the ground where they are left over night to allow any bats present to make their way out. It is recommended that these 'soft felling' works be conducted in September/October, to avoid the maternity and hibernation seasons when bats are most vulnerable to disturbance (BCT, 2016).
- Felling and hedgerow clearance works will not be undertaken unless pine marten surveys, as outlined above, have first been completed, and a derogation licence obtained from NPWS, if required.
- Works will proceed to a suitably precautionary method statement, to minimise the risk of protected or notable species being adversely affected

- Any proposed felling, arboricultural works or hedgerow removal will be conducted outside the bird breeding season, which runs from March – August inclusive. If this is not possible, works will not commence until a checking survey by a Suitably Qualified Ecologist (SQE) has been completed within the 5 days prior, which has confirmed no active nests are present. In the event any active nests are identified, the SQE will implement a buffer zone around this feature into which no works will progress until the SQE confirms that the chicks have fledged or the nest is no longer active. If works are to be completed over a longer period, the SQE will repeat the nesting bird check within the five days (or other timescale as agreed with the SQE depending on the level of risk) prior to works moving into each new area
- A toolbox talk will be given by the SQE to all site contractors prior to work commencing; this talk will cover the legal protection of key species, the areas that such species are most likely to be found, signs to look out for and what to do in the unlikely event of protected species being found when the SQE is not present
- The hedgerow proposed for removal will be checked and cleared by hand to ensure that no small mammals, such as hedgehog, will be harmed. If evidence of pine marten is found during the course of removal, all works will cease immediately and a SQE will be contacted immediately for advice on how to proceed.
- No fires will be lit as part of the proposals
- Any chemicals (including empty containers) will be stored in appropriate locked containers when not in use. These locked compartments will be located at least 30m from any waterbodies and / or watercourses
- No fencing will be installed which may hinder the movement of wildlife around the site
- No works will be permitted between sunset and sunrise, to avoid the risk of disturbing nocturnal species such as pine marten and bats.
- In the event that any other protected species are recorded, or the above species are recorded using an area where they have not (to date) been identified, works in that area will cease and the SQE will be contacted immediately for advice on how to proceed
- Any sightings of notable species on site, including pine marten, during the works period will be recorded in the site diary and reported to the SQE within 24 hours
- Spill kits will be kept on site at all times, made available to all individuals present and contractors will ensure that staff are always present on site who are trained in their use during the works

- No refuelling works will be permitted on vegetated ground, or within 30m of any waterbodies or watercourses
- Appropriate Root Protection Areas (RPAs) will be implemented around any mature trees and hedgerows which are to be retained, into which no works (including stockpiling materials) will take place. Heras fencing or similar will be used to protect such features if required
- All vegetation will be removed, or chipped to waste on site immediately following removal; in the event any vegetation needs to be piled / stored on site overnight, the vegetation piles will be dismantled by hand, with checks being undertaken to ensure no protected or notable species (such as hedgehog) are present
- In the event any species such as hedgehog are identified within the works area, these will be carefully moved to a suitably sheltered area which will not be affected by the works
- Trenches will be opened and closed within a single day. If this is not possible, one side will be cut to an angle of no more than 45°, or planks large enough for a person to walk up will be left in place overnight, to provide wildlife with a means of escape. The pits will be checked every morning prior to the recommencement of works, to ensure no protected species have become trapped
- No lighting will be installed as part of the clearance / construction works unless in accordance with the lighting guidelines outlined in section 5.3, or the written, prior agreement of a SQE
- Priority within any planting scheme will be given to native species, which are ideally of local provenance, with any new habitats being created being 'species-rich' to maximise their ecological value
- Any habitats which are retained or created – particularly hedgerows with standard trees and / or grasslands - will be subject to an appropriate management regime.

7. References

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Appendix A – Site Photographs

Photo 1: Showing the 3no. near-mature ash trees to be removed	**Photo 2**: Example of potential roost features present: Dense ivy growth & knot holes
	
Photo 3: View of the 3 mature ash trees from the south, with mature ash on opposite side of the road to be retained.	**Photo 4**: Mature sycamore with roost features present, not proposed for removal, located to the north of the proposed cattle underpass
	

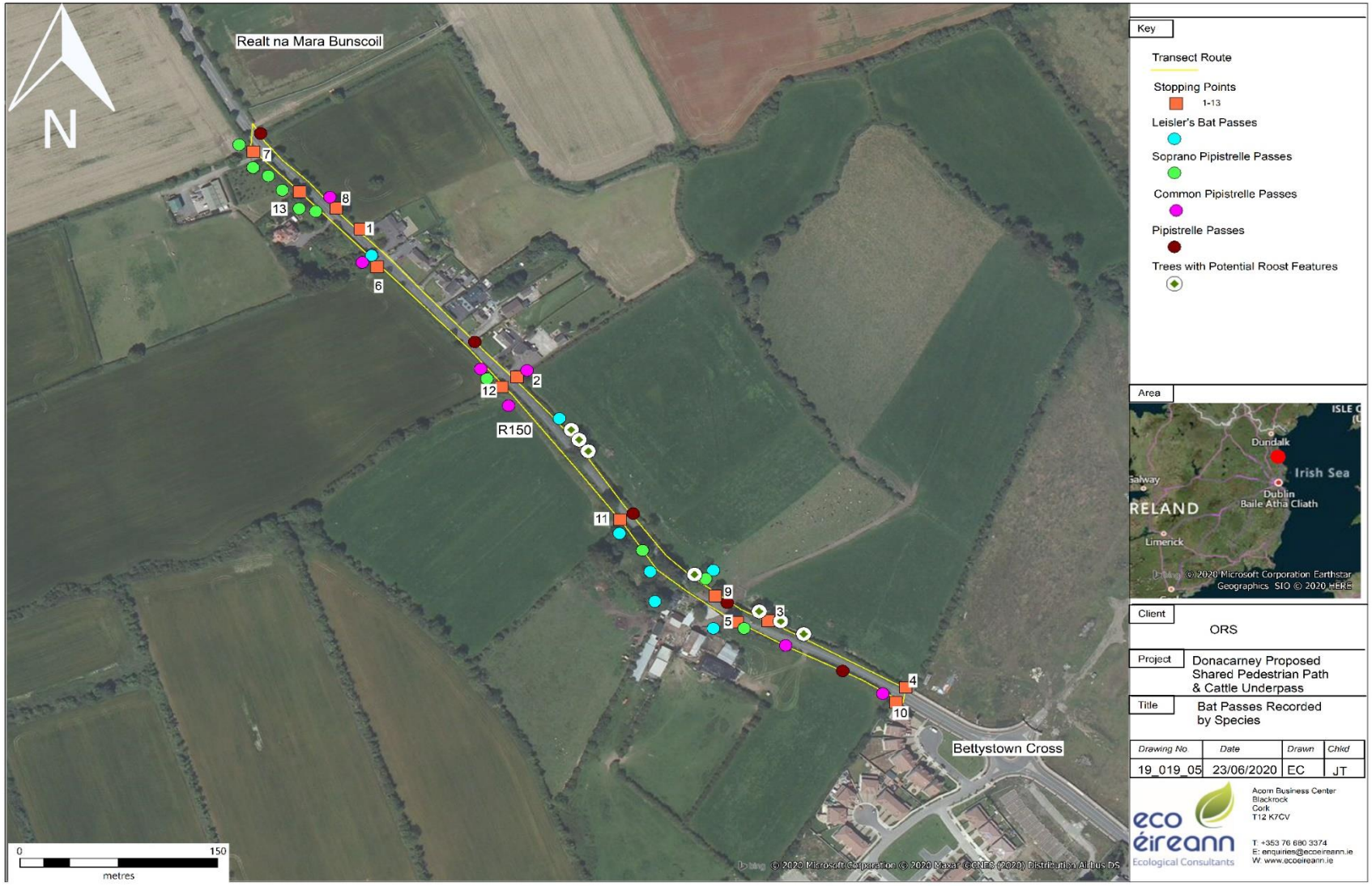
Photo 5: Semi-mature ash tree with potential roost features located to the south of the proposed cattle underpass, not proposed for removal	**Photo 6**: Mature sycamore tree with numerous potential roost features, located to the south of the proposed development, not proposed for removal
	

Photo 7: Mature sycamore as in Photo 6, with close up on potential roost features

Appendix B – Survey Results

Figure 6: Trees with Potential Roost Features Evident & Pine Marten Recordings within the Proposed Development

Figure 7: Bat Passes Recorded by Species Across the Proposed Development



Appendix C – Value of Ecological Receptors

Table G1: Examples of Ecological Receptors of Differing Value

Value	Examples
International	• An internationally designated site or candidate site (SPA, pSPA, SAC, cSAC, pSAC, Ramsar site) or an area which meets the designation criteria for such sites. • Internationally significant and viable areas of a habitat type listed in Annex 1 of the Habitats Directive, or smaller areas of such habitat, which are essential to maintain the viability of a larger whole. • Any regularly occurring, globally threatened species. • A regularly occurring population of an internationally important species, which is threatened or rare in Ireland, of uncertain conservation status • A regularly occurring, nationally significant population/number of any internationally important species.
National	• A nationally designated site (e.g. Nature Reserve) or a discrete area which meets the published selection criteria for national designation irrespective of whether or not it has yet been notified. • A viable area of a BAP priority habitat, or smaller areas of such habitat which are essential to maintain the viability of a larger whole. • A regularly occurring significant number/population of a nationally important species e.g. listed on the Wildlife Acts (as Amended). • A regularly occurring population of a nationally important species that is threatened or rare in the county or region. • A feature identified as being of critical importance in the All Ireland BAP.
Regional/County	• Viable areas of key habitat identified in the Regional or County BAP or smaller areas of such a habitat, which are essential to maintain the viability of the larger whole. • Regional/county significant and viable areas of key habitat identified as being of regional value. • A regularly occurring significant population/number of any important species important at a regional/county level.

Value	Examples
	• Any regularly occurring, locally significant population of a species which is listed in a Regional/County Red Data Book or BAP on account of its regional rarity or localisation. • Sites of conservation importance that exceed the district selection criteria but that fall short of national designation guidelines
City/District/Borough	• Areas of habitat identified in a District/City/Borough BAP. • Sites that the designating authority has determined meet the published ecological selection criteria for designation, including Local Nature Reserves selected on District/City/Borough ecological criteria. • Sites/features that are scarce within the District/City/Borough or which appreciably enrich the District/City/Borough habitat resource. • A diverse and/or ecologically valuable hedgerow network. • A population of a species that is listed in a District/City/Borough BAP because of its rarity in the locality or because of its regional rarity or localisation. • A regularly occurring, locally significant number of a District/City/Borough important species during key phases of its life cycle.
Local	• Areas identified in a Local BAP or the relevant natural area profile. • Sites/features which area scarce in the locality or which are considered to appreciably enrich the habitat resource within the local context, e.g. species-rich hedgerows. • Local Nature Reserves selected on Parish/Local ecological criteria. • Significant numbers/population of a locally important species e.g. one which is listed on the Local BAP. • Any species, populations or habitats of local importance.
Low	• Habitats of moderate to low diversity which support a range of locally and nationally common species, the loss of which can be easily mitigated.